

REMARKS

Entry of this amendment and reconsideration of the present application as amended is respectfully requested.

Claims 1-6, 8-20, 22-29 and new claims 30 and 31 are presently active in this application, claims 7 and 21 having been cancelled. Claims 1, 8-10, 15, 19 and 22 are amended. Unless an argument is made below to distinguish a claim over the cited prior art based on a change to the claims, the changes to the claims do not relate to patentability.

Specification

Claim 16 and the specification have been objected to on the grounds that there is no description of a notch filter in the specification.

The Examiner's objections are respectfully traversed on the grounds that the specification mentions at several locations the possibility of using a notch filter in connection with the receiver means. For example, at page 35, lines 18-24, reference is made to an HDRC camera including a notch frequency filter (also known as a notch filter) in order to eliminate unwanted wavelengths. Reference is also made to a notch filter at page 39, lines 8-13 wherein it is used in combination with a scanning laser infrared beam to eliminate all frequencies other than the particular infrared frequency used.

In any event, notch filters for use with special optical equipment are shown for example, in U.S. Patent No. 5,796,906.

As such, it is respectfully submitted that the specification provides proper antecedent basis for the feature of the receiver means comprising a notch filter and an adequate description of a notch filter so that the Examiner's objections to claim 16 and the specification have been overcome and should be removed.

Claim Rejections-35 U.S.C. §112

Claim 15 has been amended to change the phrase "said associated light emitting elements" to "said light emitting elements" to be consistent with claim 14 upon which it depends and therefore overcome the Examiner's rejection of claim 15 under 35 U.S.C. §112, second paragraph.

Claim Rejections-35 U.S.C. §102

Claims 1-4, 13-15 and 18-21 were rejected under 35 U.S.C. §102(e) as being anticipated by Scully (US. Patent No. 6,363,326).

The Examiner's rejection is respectfully traversed in view of amendments to independent claims 1 and 19.

With respect to claims 1-4, 13-15 and 18, claim 1 has been amended to include the subject matter of claim 7 which was not subject to this rejection. Therefore, the Examiner's rejection of claims 1-4, 13-15 and 18 has been overcome and should be removed.

With respect to claims 19-21, claim 19 has been amended to include the subject matter of claim 21 and thus recites that the arrangement for obtaining information about the object includes receiver means arranged "to obtain at least one image of the environment around the vehicle", that the vehicular system is controllable or adjustable upon the determination of the presence of an object in the environment around the vehicle and "the identification of the object" and that a processor is coupled to the arrangement and arranged to process the "at least one image obtained by said receiver means and determine the identification of any objects in said at least one image". Further, claim 1 has been amended to clarify that the processor is coupled to the vehicular system and arranged to control the vehicular system based at least in part on the determined identification of the object.

It is an important feature of the now claimed embodiment that the identification or identity of the object in the blind spot is determined because only some objects would cause concern as other objects may properly be located in the blind spot. For example, if the car is traveling on a road close to a guard rail or trees, the blind spot detector would detect an object in the blind spot and provide this information to the driver. However, the guard rail and trees do not usually pose a direct threat to the safety of the vehicle if they are behind the vehicle and thus the presence of the guard rail and trees does not and should not be indicated to the driver. On the other hand, if the object were a vehicle, then the information about the presence of the vehicle in the blind spot should be provided to the driver to enable the driver to consider defensive action.

The processor of the embodiment of the invention set forth in claim 21 is therefore designed to process images from the receiver means to obtain an identification of the object so that the vehicular system can be controlled based on the identification. The identification may be performed using a trained pattern recognition algorithm incorporated into the processor such as a neural network whereby through training using images of different objects, the neural network is capable of identifying an object from an image derived during operation of the blind spot detector. The control of the vehicular system would thus vary depending on whether the object is identified as a passive guard rail or as a potentially threatening vehicle.

Scully describes a method and apparatus for detecting objects in a blind spot of a driver in which the presence of an obstacle in the blind spot is detected and indicated on a display unit 300 to the driver.

The display unit 300 includes LEDs which indicate power on, no obstacle in the sensing volume or an obstacle present in the sensing volume (col. 3, lines 17-23).

In contrast to the embodiment of the invention set forth in claim 21, the system of Scully does not determine an identification of the object in the blind spot but rather simply the presence of an object in the blind spot. As such, innocuous, non-harmful objects may be detected and needlessly displayed to the driver by illuminating one of the LED's in the display unit 300. The driver cannot tell from the illumination of the LED's of Scully whether the object is likely to pose a threat that requires defensive action or is immovable and therefore does not require any defensive action.

Thus, Scully does not teach, disclose or suggest receiver means for obtaining an image of the environment around the vehicle and a processor for determining the identification of the object based on the image and controlling a vehicular system based at least in part on the determined identification of the object. As such, Scully cannot anticipate or render obvious the embodiment of the invention now set forth in claim 19 or claim 20 which depends from claim 19.

In view of the changes to claims 1 and 19 and the arguments presented above, it is respectfully submitted that the Examiner's rejection of claims 1-4, 13-15 and 18-21 as being anticipated by Scully has been overcome and should be removed.

Claim Rejections-35 U.S.C. §103

Claims 5, 6 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Smith et al. (U.S. Patent No. 6,281,806).

The Examiner's rejection is respectfully traversed on the grounds that Smith et al. should not be available as prior art against the patentability of claims 5, 6 and 24. The present application claims the benefit of U.S. provisional patent application Ser. No. 60/202,424 filed May 8, 2000 under 35 U.S.C. §119(e) as set forth in the specification at page 1, lines 6-7. Smith et al. issued from U.S. patent application Ser. No. 09/689,411 filed October 12, 2000 after the filing date of the '424 provisional application. Therefore, Smith et al. should not be available as prior art against the patentability of claims 5, 6 and 24.

Claims 7-12, 16, 17, 22, 23 and 25-29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully.

The Examiner's rejection is respectfully traversed in view of changes to the claims.

With respect to claims 7-12, 16 and 17, claim 1 is amended to include the subject matter of claim 7 and now recites the feature of a "processor coupled to said receiver means and structured and arranged to determine an identification of the object from which light is reflected based at least in part on the received

infrared light". As discussed above, the determination of the identification of the object is important for blind spot detection and can be performed by a processor analyzing reflected light from an object.

Scully does not expressly disclose any such determination of the identification of the object. The Examiner therefore takes a position that it would have been obvious that the control unit of Scully "can be used" to utilize pattern recognition technique to identify the object.

Obviousness of an invention can be established by a teaching or suggestion in the prior art providing a motivation to modify a prior art device to arrive at a claimed invention. However, there mere capability of modification of a prior art device does not render an invention obvious in the absence of any teaching or suggestion of the modification. The Examiner's allegation that the control unit "can be" modified to arrive at the invention has no bearing on the fact that Scully does not teach, disclose or suggest any such modification. There is absolutely no mention in Scully of the benefits of determining an identification of an object for use in a blind spot detector.

Claims 22-23 and 25-29 depend from claim 21 which similarly sets forth that the identification of the object in the blind spot is determined.

In view of the absence of any teach or suggestion in Scully to determine an identification of an object, it would not have been obvious to one skilled in the art to modify the device of Scully to arrive at the embodiments of the invention set forth in claims 1, 8-12, 22, 23 and 25-29. Thus, the Examiner's rejection of the claims as being unpatentable over Scully has been overcome and should be removed.

In view of the changes to claims 1 and 19 and the arguments presented above, it is respectfully submitted that the Examiner's rejections of the claims have been overcome and should be removed and that the present application is now in condition for allowance.

New claims

Claims 30 and 31 are added and are directed to the feature of the processor considering both image data and measured time/distance data to determine the identification of the object. As discussed in the specification at page 47, lines 8-25 with reference to Fig. 16, the image of the blind spot and the range to the object are both obtained from the returned light and passed through a feature extraction routine to a neural network which determines the identity of the object. Thus, as shown in Fig. 16, the range to the object and the acquired image are both used to determine the identification of the object.

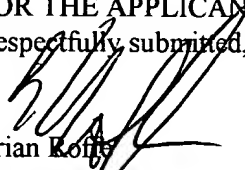
Scully does not disclose using both an image and distance or measured time of flight between the vehicle and an obstacle in order to determine the identification of the object.

If the Examiner should determine that minor changes to the claims to obviate informalities are necessary to place the application in condition for allowance, the Examiner is respectfully requested to contact the undersigned to discuss the same.

An early and favorable action on the merits is earnestly solicited.

FOR THE APPLICANTS

Respectfully submitted,


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